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NASA Researchers Document Shrinking Of Greenland's Glaciers

Greenland's southeastern glaciers are rapidly thinning and their lower elevations may be particularly sensitive to potential climate changes, a NASA study suggests.

"The results of this study are important in that they could represent the first indication of an increase in the speed of outlet glaciers," said Bill Krabill, principal investigator, Observational Science Branch (OSB), Laboratory for Hydrospheric Processes at Wallops. An outlet glacier acts as a major ice drainage region for an ice sheet.

"The excess volume of ice transported by these glaciers has had a negligible effect on global sea level thus far, but if it accelerates or becomes more widespread, it would begin to have a detectable impact on sea level," Krabill said.



During a press conference held at Wallops, March 5, Bill Krabill points to an area of the southeastern section of Greenland that was surveyed.

Rick Huey digital photo.

In the March 5 issue of *SCIENCE*, researchers report the glacial thinning is too large to have resulted from increased ice-surface melting or decreased snowfall. The researchers believe the thinning, as much as 30 feet over five years in some locations, is the result of increasing discharge speeds of glaciers flowing into the Atlantic Ocean.

Krabill said surface-melt water might be seeping to the bottom of glaciers. Such seepage may be reducing the friction between the ice and the rock below it, enabling the glaciers to slide with less friction across the bedrock and thus allow more ice to slip off into the ocean, according to Krabill.

"The results of this study are significant because they provide the first evidence of widespread thinning of low-elevation parts of one of the great polar

ice sheets. The results also suggest that the thinning outlet glaciers must be flowing faster than necessary to remove the annual accumulation of snow within their basins," said Krabill.

"Why they are behaving like this is a mystery," said Krabill, "but it might indicate that the coastal margins of ice sheets are capable of responding quite rapidly to external changes, such as a potential warming of the climate."

Researchers noted that while some internal areas of Greenland that were surveyed showed ice thickening, areas along the coast showed ice thinning.

"Taken as a whole, the surveyed region is in negative balance," Krabill said.

In 1993 and 1994, NASA researchers surveyed the Greenland ice sheet using an airborne laser altimeter flown on a NASA P-3 aircraft and measured the thickness of the entire ice sheet. Ten flight lines flown in 1993 in Southern Greenland were resurveyed in 1998. The flight lines in Northern Greenland flown in 1994 will be resurveyed in May 1999. Throughout the study, pilots have used the Global Positioning System and other navigational equipment to fly the same flight path some 400 meters above the icy surface.

The results showed three areas in the South accumulating at rates up to ten inches per year. These areas located in the internal sections of Greenland are in regions of high snowfall.

In the outer regions of the ice sheets, the researchers reported large areas of thinning, with the rate of thinning increasing rapidly towards the ocean. Most-rapid thinning rates (more than three feet per year) were observed in the lower depths of East-coast outlet glaciers, the researchers reported.

The researchers noted that the areas of thinning in the East also saw warmer than normal temperatures for 1993 to 1998. "However, we also observe areas of thinning near the West coast, where many locations were cooler than normal," the researchers reported.

These surveys have established baseline data sets that will be extended with information from NASA's ICESAT spacecraft. The ICESAT satellite laser altimeter will be launched in 2001 to measure ice-surface elevations in Greenland and Antarctica.

Further information on the Greenland mapping project, including the technology behind the science, can be found on the web at: <http://aol.wff.nasa.gov/aoltm.html>

Lewis Research Center Has Name Changed

NASA Administrator Daniel S. Goldin announced March 1, 1999 the name of the Lewis Research Center, Cleveland, OH, has officially changed to the John H. Glenn Research Center at Lewis Field.

"I cannot think of a better way to pay tribute to two of Ohio's famous sons — one an aeronautic researcher and the other an astronaut legend and lawmaker — than by naming a NASA research center after them," said Goldin.

"We are honored that the center will now bear the name of two great men, John Glenn and George Lewis," said Center Director Donald Campbell. "The blending of names reflects the pioneering research in aerospace technology that employees have performed throughout the center's history and will continue to perform in the future."

The research facility, built in 1941, was named for George William Lewis, research director for the National Advisory Committee for Aeronautics (NACA), soon after his death in 1948. On Oct. 1, 1958, the name was modified from Lewis Flight Propulsion Laboratory to Lewis Research Center to reflect its becoming part of the new National Aeronautics and Space Administration.



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Wallops Shorts..... Career Day

Pat Pruitt, Facilities Management Branch; **Barton Bull**, GN&C Engineering Branch; and **Kelly Long**, GHG Corporation participated in a Career Day event at Arcadia High School, March 3 for juniors and seniors from Tangier, Nandua, Arcadia and Chincoteague High Schools.

Weather Summary

by Ted Wiltz, Senior Meteorologist

The trend for mild winter weather that has persisted along the Eastern Shore for two years continued into February. Little snowfall and mild temperatures continued to make what is normally the coldest time of the year a very tolerable weather experience.



For the fourth month in a row temperatures have remained well above average. The average temperature for February of 40° is almost 3° above normal. Although temperatures remained mild, no new record highs or lows were established for the month. The warmest temperature was a reading of 63° on Feb. 17. The coldest reading occurred on the morning of Feb. 23 when the temperature dipped to 18°.

Winter weather conditions flirted with us on Feb. 24 and 25 when we received a dusting of snow each day. No measurable accumulation occurred during the month. There also was only 2.38 inches of rainfall, which is .69 inches below the monthly average. Although somewhat unusual for February, we actually had two days with thunderstorms in the area; indicative of the continuing above average temperatures that at times seemed more like spring than winter.



Beautiful weather is usually the norm on the Eastern Shore during April. We usually average only 2.63 inches of rainfall, making April the driest month of the year. There are usually 10 days during the month when we experience measurable precipitation and have thunderstorms on two or three days, a sure sign of spring.

With average high temperatures starting out near 60°, any lingering winter chill decreases significantly by the end of April when temperatures are in the mid 60's. It is not unusual to see a few days with temperatures in the up 70's and 80's, especially as May approaches. The record high of 93° was set on April 26, 1990. Average low temperatures near the beginning of April are near 40° and warm to the upper 40's by the end of the month. Although temperatures should warm comfortably throughout the month, there are still days especially in early April when the morning low could dip below freezing. Freezes have occurred as late as April 25. Temperatures as low as 24° during the month have been recorded at Wallops Island.

Gardeners, take heed, if you're thinking of rushing out and planting in early April, you may have to deal with one last springtime freeze.

St. Paddy's Party

**March 17
5 p.m.
Bldg. F-3**



Green beer and Irish food.

Surprise entertainment. Dress in your best IRISH RIG and win a prize!

Upcoming Training

Technology Transfer and Commercialization

DATE: March 23-25, 1999

TIMES: Beginning at 7 p.m. on March 23
8 a.m. to 5 p.m. - March 24
8 a.m. to noon - March 25

LOCATION: Bldg. E-104

This program is designed to provide the knowledge and skills required to become more pro-active in the commercialization process for new technologies developed as a result of NASA contracts or internal NASA R&D. The course has been updated to incorporate the NASA Technology Commercialization Process Handbook (to be published as a NPG and NPD).

Anyone interested in the course should contact Sherry Kleckner, x1204.



Don Grant, Computer Sciences Corporation, prepares to donate his 90th pint of blood during the Red Cross Blood Drive held March 4. Thanks to all 31 donors.

Rick Huey digital photo

For Sale

1991 Polo Green CORVETTE. Low mileage, fully loaded, CD player, car phone, glass top. Call (410) 957-2013 after 5 p.m.

LONGABERGER BREAD BASKET, emerald vine liner, three tea-size protectors, two wood dividers. Will trade for a 1997 Horizons of Hope basket (cancer). Call Terry Ewell, (757) 824-5733.

NASA College Scholarship Fund

The NASA College Scholarship Fund, Inc., a Texas nonprofit corporation was established to award scholarships to qualified dependents of NASA and former NASA employees Agency-wide. James A. Michener, noted Pulitzer Prize winning author, established the scholarship fund as the direct result of a substantial unsolicited gift offer.

Five scholarships will be awarded in the amount of \$2,000 each in the 16th year of the program (1999-2000 school year). The renewable scholarship is for a maximum of \$8,000 over 6 calendar years. Applicants must be pursuing a course of study in the science or engineering fields that will lead to a recognized undergraduate degree at an accredited college or university in the United States.

All applicants must, in addition to the NASA dependency requirement, be graduated from an accredited public, private or parochial high school or be currently enrolled in college with good academic standing. An applicant must have a combined high school grade and college (if any) grade point average of 2.5 on a 4.0 scale or the equivalent.

Applicants must be dependents of retired NASA employees, or current NASA employees who have actually been employed by NASA for a period of two years as of January of the scholarship year. There is no minimum period of employment requirement for eligible dependents of former NASA employees or former reimbursable detailees to NASA who died while employed by NASA.

All completed application forms, transcripts, scores or materials must be mailed to Johnson Space Center by March 31, 1999. All late applications will be returned.

Application forms are available in the Public Affairs Office, Bldg. F-6. Contact Betty Flowers, x1584 or Keith Koehler, x1579 for forms or additional information.

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